Analysis of Antitussive Drugs by HPLC

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Abstract

The effect of antitussive or cough-relieving drugs is based on their sedative influence on certain parts of the brain. Usually they are derivatives of morphine, metha-done, phenylacetic acid or phenothiazine. One major problem of these drugs is that patients can become addicted to them.

Figure 1 shows the HPLC chromatogram of dextromethorphan using gradient analysis on a reversed phase column and UV detection. The autosampler temperature was set to 4 ºC to avoid decomposition of the samples.

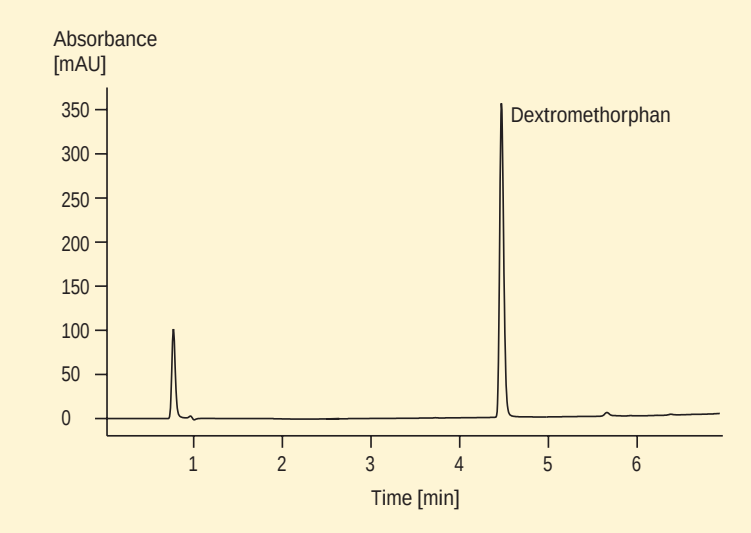

Figure 1
Analysis of dextromethorphan

Conditions

Column
4.6 x 75 mm Zorbax SB-C18 3.5 µm
Mobile phase
A = 0.025 M KH_2PO_4 in water
(pH = 3 with H_2SO_4)
B = acetonitrile
Flow rate
1.0 ml/min
Gradient
10 % B to 80 B % in 8 min
Column wash
80 % B to 10 % B in 2 min
UV detector
variable wavelength detector
204 nm, standard cell
Column compartment temperature
60 °C
Stop time 10 min
Post time 5 min
Injection volume 5 µl

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The performance of the HPLC method is shown in the table below.

Compound	LOD for S/N=2 (mg/l)*	Precision of RT (RSD of 10 runs) (100 mg/l)*	Precision of Area (RSD of 10 runs) (100 mg/l)*	Linearity (Cor. factor) (1-100 mg/l)*
Dextromethorphan	0.1	0.02	0.13	0.99998

* Injection volume: 5 µl

The HPLC method presented here shows an easy but reliable and precise analysis of the antitussive drug dextromethorphan. The values for LOD, precision of RT, precision of area and linearity show the good performance of the analysis.

Equipment

Agilent 1100 Series

- Quaternary pump (includes vacuum degasser)
- Thermostatted autosampler
- Thermostatted column compartment
- Variable wavelength detector, standard flow cell, 10-mm path length, 13-µl cell volume

Alternative:

- Vacuum degasser
- Binary pump
- Diode-array detector, standard flow cell 10-mm path length, 13-µl cell volume
- Agilent ChemStation + 3D software

Columns

- Zorbax SB-C18, 3.5 µm, 4.6 x 75 mm (Agilent part number 866953-902)
- *Recommended:* Guard cartridges Zorbax SB-C18, 5 µm, 4.6 x 12.5 mm (Agilent part number 820950-920, 4/pk)

Note:
Since the method was specifically developed on the Agilent 1100 Series system you might not be able to reproduce this analysis on an older system or even on a new system with lower performance. To avoid sample decomposition it is necessary to use a cooled autosampler, for example, the Agilent 1100 Series thermostatted autosampler.

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